

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
(George C. Marshall Space Flight Center)**

Human Exploration and Operations (HEO) Mission Directorate
Space Launch System Program
Advanced Development Office
Marshall Space Flight Center, AL 35812

Space Launch System (SLS) Advanced Booster Engineering Demonstration and/or Risk
Reduction (ABEDRR)

**NASA RESEARCH ANNOUNCEMENT (NRA)
SOLICITING APPLIED RESEARCH PROPOSALS**

NNM12ZPS001N

NRA Issued: February 9, 2012

Proposals Due: April 9, 2012

EXECUTIVE SUMMARY

Space Launch System—A New National Capability

The U.S. Space Launch System (SLS) will provide an entirely new capability for human exploration beyond Earth orbit. It will also provide back-up to commercial and international partner transportation services to the International Space Station. Designed to be flexible for crew or cargo missions, the SLS will be a safe, affordable, and sustainable avenue to continue America's journey of discovery from the unique vantage point of space.

America's new heavy-lift vehicle will be the most powerful rocket ever developed, evolving to a 130-metric-ton vehicle built around a core stage which will share common design, supplier base, avionics, and advanced manufacturing techniques with the Upper Stage. It will use a liquid hydrogen and liquid oxygen propulsion system, relying on the Space Shuttle's RS-25 engine for the core stage and the J-2X engine for the Upper Stage. Dual, five-segment solid rocket boosters, now in testing, will be used for initial flights of the Block 1 vehicle, while Advanced Boosters will be competed for the evolved capability.

This NASA Research Announcement (NRA), entitled "Space Launch System (SLS) Advanced Booster Engineering Demonstration and/or Risk Reduction (ABEDRR)," intends to: 1) Reduce risks leading to an affordable Advanced Booster that meets the evolved capabilities of SLS; and 2) Enable competition by mitigating targeted Advanced Booster risks to enhance SLS affordability.

The ABEDRR NRA solicits proposals that enhance affordability, improve reliability, and meet the NRA specified SLS vehicle mission performance requirements. The Offeror shall:

- 1) Propose an Advanced Booster concept in response to a set of top level performance requirements that meet the SLS vehicle mission requirements (provided by NRA Appendix A). The engineering demonstration and/or risk reduction (EDRR) efforts shall tie directly to the Offeror's proposed Advanced Booster concept.
- 2) Identify its most relevant risks associated with adaptation of Advanced Booster technology (liquid, solid, and/or alternate propulsion cycle (e.g., hybrid)) to the SLS vehicle configuration.
- 3) Propose related EDRR efforts on how key risks can be mitigated. One to five EDRR efforts for each Advanced Booster concept is preferred.

Note: Advanced Booster concepts that require modification of SLS Program requirements will be considered if significant affordability gains can be shown.

NASA will award contracts to perform selected EDRR efforts. The selection of EDRR efforts are based on (described in detail within the NRA): (1) Relevance to NASA's Objectives of the Offeror's proposed EDRR efforts within the context of the Offeror's Advanced Booster concept, (2) the Intrinsic Merit of the individual EDRR efforts to the Government, and (3) the proposed Price. Multiple awards are anticipated considering the merits of the submitted proposals in relationship to the evaluation criteria; however, NASA reserves the right to make no award,

select any proposed stand-alone EDRR, or combination of EDRRs from the Offeror's proposal to maximize the programmatic benefits for NASA.

An Offeror that is awarded a contract as a result of this NRA is not guaranteed an award for the future Advanced Booster Design, Development, Test, and Evaluation (DDT&E) acquisition. Conversely, if an Offeror does not receive an award as a result of this NRA, it does not preclude an award during the Advanced Booster DDT&E acquisition.

The Agency anticipates total funding availability of \$200,000,000 to be split among multiple awards made as a result of this NRA. It is anticipated that the period of performance for any contracts awarded as a result of this NRA is not expected to exceed 30 months and will have an effective date of October 1, 2012. Participation in this program is open to all categories of U.S. organizations, including educational institutions, industry, and nonprofit institutions. Other Government agencies, Federally Funded Research and Development Centers (FFRDCs), and NASA Centers or its employees may not propose to this NRA except as permissible as a supplier, consultant, or subcontractor to an Offeror through separate agreements with the Offeror, such as a Space Act Agreement, other Government agency agreement, or a contract. In addition, NASA employees are not permitted to be key personnel on these proposals. For purposes of this NRA, participation by non-U.S. organizations and Foreign Governments is limited to the direct purchase of supplies and/or services, which do not constitute research, except as allowed by NASA FAR Supplement 1852.235-72.

Technical details of the solicited effort are provided in Appendix A and Appendix B of this NRA. Appendix B contains export controlled technical data and is available within the secure Technical Library on Knowledge Now (<https://nsckn.nasa.gov>). The Offeror should refer to Section 1.3 of this NRA for Technical Library access information. The due date for proposal submission is April 9, 2012. An interested Offeror should monitor Government Point of Entry (FedBizOpps), NASA Acquisition Internet Service (NAIS), and the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) for any amendments issued against this solicitation.

Funds are not currently available for awards under this NRA. The Government's obligation to make award(s) is contingent on the availability of appropriated funds from which payment can be made and on the receipt of proposals that NASA determines are acceptable for award under this NRA.

The Offeror is hereby informed that technical EDRR areas covered by this NRA may require access to technical data, the export of which is controlled under the Export Control Act, Title 50, United States Code App. 2401-20, the Arms Export Control Act, Title 22, United States Code 2751 – 2794, or both. No award will be made to any Offeror unless the NASA Contracting Officer is satisfied that performance of the awarded effort will not involve an illegal export of technical data under either statute.

This NRA will include substantial goals for small business concerns across the full spectrum of socio-economic concerns. The SLS program will continue to work closely with NASA's Office

of Small Business Programs to maximize opportunities for all parts of the Agency's socio-economic programs.

All questions shall be submitted in writing to the point of contact shown below within 30 calendar days of the issue date of this NRA. Questions received after the specified date will not be addressed. Questions and responses will be posted on the web at <http://www.fedbizopps.gov>, <http://prod.nais.nasa.gov>, or <http://nspires.nasaprs.com/> site.

Point of Contact:

NASA Marshall Space Flight Center
Attn: Kathryn Cooper, PS41
Marshall Space Flight Center, AL 35812
Mary.K.Cooper@nasa.gov

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SUMMARY OF SOLICITATION

1.0 FUNDING OPPORTUNITY DESCRIPTION

1.1 NASA Safety Policy. Safety is the freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment. NASA's safety priority is to protect the following: (1) the public, (2) astronauts and pilots, (3) the NASA workforce (including employees working under NASA award instruments), and (4) high-value equipment and property.

1.2 Proposal Funding Restrictions

- Funds are not currently available for award(s) under this NRA. The Government's obligation to make award is contingent on the availability of appropriated funds from which payment can be made and on the receipt of proposals that NASA determines are acceptable for award under this NRA.
- Travel, including foreign travel, is allowed as may be necessary for the meaningful completion of the proposed research, as well as for publicizing its results at appropriate professional meetings.
- For purposes of this NRA, participation by non-U.S. organizations and Foreign Governments is limited to the direct purchase of supplies and/or services, which do not constitute research, except as allowed by NASA FAR Supplement 1852.235-72. However, subject to export control restrictions, a foreign national may receive payment through a NASA award for the conduct of research while employed either full or part time by a U.S. organization (see Section 1.6 of the *NASA Guidebook for Proposers Responding to a NASA Research Announcement* (hereafter referred to as *the NASA Guidebook for Proposers*, <http://www.hq.nasa.gov/office/procurement/nraguidebook/proposer2011.pdf>).

1.3 Proposal Preparation. All information needed to respond to this solicitation is contained in this NRA, *the NASA Guidebook for Proposers*, and within the secure Technical Library. By reference, the January 2011 edition of the *NASA Guidebook for Proposers* is incorporated into this NRA, and the Offeror is responsible for understanding and complying with its procedures for the successful, timely preparation and submission of its proposal. The Offeror is advised that in the event of any discrepancies or inconsistencies noted between this NRA and *the NASA Guidebook for Proposers*, this NRA takes precedence. Additionally, the Offeror is advised that this NRA takes precedence over any previously provided briefing, answers to questions, and the Draft NRA. Proposals that do not conform to its standards may be determined noncompliant and rejected without review.

The Offeror is notified that access to the SLS NRA NNM12ZPS001N secure Technical Library folder is through the following Knowledge Now website: <https://nsckn.nasa.gov/>. In order to process requests for access to the secure Technical Library, the Offeror shall go to <https://nsckn.nasa.gov/> and create a profile. Once a profile has been created, the Offeror shall

provide the following to the Contracting Officer via email at Mary.K.Cooper@nasa.gov.

- a. Requestor's Full Name
- b. NSCKN Username
- c. Email Address
- d. Company Name
- e. Verification of U.S. Company via signed Affidavit (one per company required)

Upon receipt of the above information, access will be granted as soon as possible by the Contracting Officer. Access to the secure Technical Library is limited to five individuals per company.

The SLS ABEDRR acquisition is subject to the restrictions imposed by Export Administration Regulations (EAR) and International Traffic in Arms Regulations (ITAR). It is incumbent upon the Offeror to assure the protection and nondisclosure of relevant intellectual property, including compliance with the requirements of the EAR and ITAR. U.S. Offerors should be aware that hardware, software, or related materials and services, including technical data, may be subject to U.S. export control laws, including the U.S. Export Administration Act, the Arms Export Control Act, and their associated regulations. It is incumbent upon the U.S. Offeror to strictly comply with all U.S. export control laws, and when applicable, assume the responsibility for obtaining export licenses, or other export authority, as may be required. Under U.S. law and regulations, spacecraft and their specifically designed, modified, or configured systems, components, and parts are generally considered "Defense Articles" on the United States Munitions List and are, therefore, subject to the provisions of the ITAR, 22 CFR Parts 120-130. It is the Offeror's responsibility to determine whether any proposal information is subject to the provisions of ITAR, and to comply with the provisions of ITAR. Information about U.S. export regulations is available at <http://www.pmddtc.state.gov/> and <http://www.bis.doc.gov/>.

The SLS ABEDRR acquisition is not subject to the prohibitions set forth in the Iran, North Korea, and Syria Nonproliferation Act (INKSNA) (Public Law [P.L.] 106-178, as amended by P.L. 107-228, P.L. 109-112, P.L. 109-353, and P.L. 110-329), given that the research purposes and objectives of this acquisition are not directly related to human space flight. The Offeror should be aware that the future Advanced Booster Design, Development, Test, and Evaluation (DDT&E) phase would likely be subject to the prohibitions set forth in INKSNA. The Offeror is encouraged to submit ABEDRR solutions that will remain compliant with INKSNA or to describe what steps the Offeror would take to address these prohibitions for future solicitations. The Offeror's approach shall be addressed as specified in Section 4.2.5.6 of this NRA, if necessary.

2.0 AWARD INFORMATION

2.1 Funding and Award Policies

NASA intends the effective date of any selected and successfully negotiated award as a result of this solicitation to be October 1, 2012. However, this award date may be later based on the

workload experienced by NASA, the availability of appropriated funds, and any necessary post-selection negotiations with the proposing organization. NASA reserves the right to cancel selection of an award to an apparent successful Offeror if the resultant negotiations prove to be unproductive in reaching an agreement that is in the best interest of NASA, or if a reduction in program funding occurs. Additionally, NASA reserves the right to subsequently negotiate and make award to an Offeror not initially selected. The Offeror's proposal shall be valid for 12 months to allow for a later award if the opportunity becomes available, unless withdrawn by the Offeror prior to award.

An Offeror that is awarded a contract as a result of this NRA is not guaranteed an award for the future Advanced Booster DDT&E acquisition. Conversely, if an Offeror does not receive an award as a result of this NRA, it does not preclude an award during the Advanced Booster DDT&E acquisition.

It is anticipated that awards made through this NRA will be in the form of a firm-fixed-price (FFP) contract. The Agency anticipates total funding availability of \$200,000,000 to be split among multiple awards made as a result of this NRA. The Government's planned funding allocation is as follows: 30% in FY2013; 50% in FY2014; and 20% in FY2015.

Per the *NASA Guidebook for Proposers*, funding mechanisms used by NASA may include grants, cooperative agreements, and contracts, and others; however, the Offeror is notified that funded Space Act Agreements (SAAs) are not an allowable award instrument for this NRA. NASA funding contribution will be in the form of a capped fixed amount. The Offeror is notified that if an alternate contract or agreement is proposed, the Offeror shall detail any advantage that would be afforded to the Government. The Offeror shall address the risk effect of the alternate proposed contract type, or agreement, instead of the planned FFP contract. Should an Offeror propose a cooperative agreement in place of a FFP contract, all deliverables and requirements within this NRA, Attachment 1 Model Contract, shall be required during performance of the proposed cooperative agreement. The Offeror is reminded that cost sharing as proposed through a cooperative agreement with a commercial recipient is expected to contribute at least 50% of the total resources necessary to accomplish the cooperative agreement effort. Recipient contributions may be cash, non-cash (in-kind) or both.

The Offeror is notified that wherever model contract is referenced, and the Offeror intends to propose an alternate contract or agreement, the Offeror shall provide its alternate approach.

2.2 Successor Proposals and Resubmissions. Successor proposals and resubmissions will not be entertained within this NRA due to its unique requirements.

2.3 Award Period of Performance. It is anticipated that the period of performance for any contracts awarded as a result of this NRA is not expected to exceed 30 months and will have an effective date of October 1, 2012. Any proposed period of performance shall be justified in the proposal. The appropriateness of the proposed period of performance will be evaluated. NASA may select proposals for shorter award duration than proposed.

3.0 ELIGIBILITY INFORMATION

3.1 Eligibility of Applicants. Participation in this program is open to all categories of U.S. organizations, including educational institutions, industry, and nonprofit institutions. Other Government agencies, FFRDCs, and NASA Centers or its employees may not propose to this NRA except as permissible as a supplier, consultant, or subcontractor to an Offeror through separate agreements with the Offeror, such as a Space Act Agreement, other Government agency agreement, or a contract. In addition, NASA employees are not permitted to be key personnel on these proposals. For purposes of this NRA, participation by non-U.S. organizations and Foreign Governments is limited to the direct purchase of supplies and/or services, which do not constitute research, except as allowed by NASA FAR Supplement 1852.235-72.

An Offeror electing to propose a cooperative agreement with NASA shall provide within its proposal sufficient information on what technical assistance NASA will provide for the cooperative agreement. The Offeror shall include details within the EDRRs of the technical assistance that will be provided by NASA. The Offeror shall provide written evidence of any agreement from NASA Centers on acceptance of the work assignments under Attachment J-5, Subcontracting Plan. If the Offeror proposes use of a cooperative agreement as the prime award instrument, SAAs are not allowed for other teaming arrangements.

3.2 Number of Proposals and Teaming Arrangements. There is no restriction on the number of proposals that an organization may submit to this solicitation or on the teaming arrangements for any one proposal. However, each proposal shall be a separate, stand-alone, complete document for evaluation purposes. One to five risks and associated EDRRs efforts for each Advanced Booster concept is preferred.

3.3 Cost Sharing or Matching. Cost sharing is not required for contract awards except as provided in NFS 1816.303-70 for awards resulting from unsolicited proposals for research submitted by commercial organizations. NFS 1816.303-70 is located at http://www.hq.nasa.gov/office/procurement/regs/1816.htm#16_303-70. For a commercial organization seeking to receive a cooperative agreement, cost sharing is required, unless the commercial organization can demonstrate that they will not receive substantial compensating benefits for performance of the work. If no substantial compensating benefits will be received, then cost sharing is not required, but can be accepted. *NASA Grant and Cooperative Agreement Handbook*, Section B, Provision 1260.123, "Cost sharing or matching," and the special conditions at Section A, subpart 1260.4(b) describes cost sharing and allowability for awards with commercial firms that do not require cost sharing. *NASA Grant and Cooperative Agreement Handbook*, Section D, Provision and Section 1274.204, "Costs and payments," located at http://prod.nais.nasa.gov/pub/pub_library/grantd.html#1274204 of the NASA Grant and Cooperative Agreement Handbook describes the acceptable forms of cost sharing for commercial organizations.

3.4 Corporate Resources. While inclusion of corporate resources is not part of the evaluation criteria, it may impact NASA's evaluation of the intrinsic merit of the proposal. For example, an Offeror's investment in facilities, tooling, or independent research and

development (IR&D) that exceeds the Offeror's proposed EDRR priced activities will be considered as part of intrinsic merit and in understanding the reasonableness of price.

4.0 PROPOSAL AND SUBMISSION INFORMATION

4.1 Address to Request Proposal Package. An interested Offeror should monitor FedBizOpps, NAIS, and NSPIRES for any amendments issued against this NRA.

4.2 Content and Form of the Proposal Submission

4.2.1 General

4.2.1.1 Proposal submissions shall be prepared in accordance with "Instructions for Responding to NASA Research Announcements (NFS 1852.235-72) (NOV 2004)" as supplemented by Paragraph (n) (JAN 2006) as contained in *the NASA Guidebook for Proposers, Appendix B*. NFS Clause 1852.235-72 is hereby incorporated by reference.

4.2.1.2 Proposals received in response to a NRA will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA, to be used as the basis of a solicitation or in negotiation with other organizations. In addition, pre-award synopses are not published for individual proposals.

4.2.1.3 A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act. The Offeror's submitted Statement of Work (SOW) will become the NASA SOW, upon successful negotiation, as an attachment to any resultant contract.

4.2.1.4 NASA does not have mandatory forms or formats for responses to NRAs; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals shall initially be as complete as possible and be submitted on the Offeror's most favorable terms.

4.2.1.5 To be considered for award, a submission shall, at a minimum, present a specific effort within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

4.2.2 The following information is needed to permit evaluation in an objective manner. NRAs will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter.

- The legal name and address of the organization and specific division if part of a larger organization;
- A brief title suitable for use in the public press;
- Type of organization: e.g., small business, minority, women-owned;
- Name and telephone number of the key personnel and business personnel who may be contacted during evaluation or negotiation;
- Identification of other organizations and agencies that are currently evaluating a proposal for the same efforts;
- Identification of the NRA, by number and title, to which the proposal is responding;
- Dollar amount requested, desired starting date, and duration of effort;
- Date of submission; and
- Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization (unless the signature appears on the proposal itself).

4.2.3 Restriction on Use and Disclosure of Proposal Information. Information contained in proposals is used for evaluation purposes only. The Offeror shall, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following notice on the title page of the proposal and specify the information subject to the notice by inserting an appropriate identification in the notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

Notice

Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the Offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

4.2.4 Additional Proposal Guidance. The proposal shall address the evaluation factors contained in Section 5.1, Evaluation Criteria and Basis for Award. If an Offeror wishes to propose multiple Advanced Booster concepts, each concept shall be submitted in a separate proposal, including applicable EDRR efforts. For example, if an Offeror proposes both a Liquid Rocket Booster (LRB) concept and a Solid Rocket Booster (SRB) concept, each proposal shall be complete and submitted separately.

4.2.5 Proposal Content. Proposal submissions are to be clearly separated into four volumes: Relevance to NASA Objectives, Intrinsic Merit, Price, and Model Contract. Each volume shall contain a table of contents. The proposal volumes are outlined as follows:

- Volume 1 – Relevance to NASA Objectives: This volume of the proposal shall contain the Offeror's information as required in response to Section 4.2.5.1 of this NRA. The provided information shall be submitted in accordance with the outlined structure of this section.
- Volume 2 – Intrinsic Merit: This volume of the proposal shall contain the Offeror's information as required in response to Section 4.2.5.2 of this NRA. The provided information shall be submitted in accordance with the outlined structure of this section.
- Volume 3 – Price: This volume of the proposal shall contain the Offeror's information as required in response to Section 4.2.5.3 of this NRA. The provided information shall be submitted in accordance with the outlined structure of this section.
- Volume 4 – Model Contract: This volume of the proposal shall contain the Offeror's information as required in response to Section 4.2.5.4 of this NRA. The provided information shall be submitted in accordance with the outlined structure of this section.

The outline of each Factor (i.e., Relevance to NASA Objectives, Intrinsic Merit, and Price) is provided for the use in organizing the Offeror's proposal. The Offeror should not construe the order of the importance or relative weighting of any required information within the individual Factors as there are no subfactors or discrete values attached to any subsection, element, or criteria listed below.

4.2.5.1 Volume 1 – Relevance to NASA Objectives

4.2.5.1.1 Executive Summary. The Offeror shall include a concise Executive Summary describing the Advanced Booster concept and EDRR effort(s) proposed.

4.2.5.1.2 Advanced Booster Concept Description. The Offeror shall submit a description of its Advanced Booster concept that achieves the NASA objectives to enhance affordability, improve reliability, and meet a set of performance requirements described in Appendix A utilizing the NASA provided technical data in Appendix B, sheets 1.1 through 1.6. The Offeror's description shall supplement the data provided in the Excel

worksheets contained in Appendix B. Appendix B serves to provide notional physical data for the other elements of the NASA SLS reference vehicle, mission ground rules and assumptions (GR&As), and ascent data to perform a trajectory analysis assessing the reference vehicle performance to the specified LEO target. Note: Appendix B is only available within the secure Technical Library on the Knowledge Now database, <https://nscn.nasa.gov>. An Advanced Booster concept that requires modification of the SLS launch vehicle requirements in Appendix A will be considered if significant affordability gains are documented in the Affordability Plan. These descriptions shall include all relevant information requested below, as applicable.

4.2.5.1.2.1 Solid Rocket Booster (SRB) Propulsion

Subsystem Description. For a SRB concept, the Offeror's Advanced Booster concept description shall include a solid motor description by completing Appendix B, Sheets 1.1 through 1.6 (as applicable) and Sheet 2, showing the input data used and the resulting output data. The Offeror shall submit its responses utilizing the formatting supplied within the Appendix B Excel document.

4.2.5.1.2.2 Hybrid Rocket Booster (HRB) Propulsion

Subsystem Description. For a HRB concept, the Offeror's Advanced Booster concept description shall include a hybrid motor description by completing Appendix B, Sheets 1.1 through 1.6 (as applicable) and Sheet 3, showing the input data used and the resulting output data. The Offeror shall submit its responses utilizing the formatting supplied within the Appendix B Excel document.

4.2.5.1.2.3 Liquid Rocket Booster (LRB) Propulsion

Subsystem Description. For a LRB concept, the Offeror's Advanced Booster concept description shall include an engine system description and a Main Propulsion System (MPS) description by completing Appendix B, Sheets 1.1 through 1.6 (as applicable) and Sheet 4, showing the input data used and the resulting output data. The Offeror shall submit its responses utilizing the formatting supplied within the Appendix B Excel document.

4.2.5.1.2.4 Reference Vehicle Performance.

The Offeror shall submit medium fidelity flight simulation analysis results of the flight performance of the Offeror's Advanced Booster concept when integrated with the vehicle information provided in Appendices A and B (sheets 1.1 through 1.5). The Offeror shall describe the flight simulation technique, data, and assumptions used for the ascent trajectory analysis. All NASA-provided trajectory GR&As provided in Appendix B shall be used in performing this trajectory analysis. Deviations from NASA's technical data and GR&A due to the operational or functional character of the Offeror's Advanced Booster concept shall be noted in the appropriate spreadsheet location and a description of the issue and rationale for the deviation (i.e., impact to its analysis for adherence to NASA GR&As) can be provided in the descriptive narrative with appropriate cross-references. Suitable analytical confidence for this NRA may be met through the use of a three degree of freedom trajectory analysis tool of the Offeror's choosing, a description of which shall be included with the Offeror's analysis. The results from the vehicle trajectory analysis for the SLS reference mission shall be provided in the worksheet open cells provided in Appendix B, sheets 1.1 through 1.6. A summary of the capability to meet the SLS program requirements shall be submitted in Appendix B, sheet 1.6. These results include

payload capability, maximum ascent acceleration, maximum dynamic pressure, booster-core interface, booster-ground interface, load path, booster height, and vehicle width (core + boosters) (Reference Appendix B Sheet 1.6). The extent of reliance on propulsive elements (e.g. Core Stage throttling) other than the Offeror's Advanced Booster to achieve performance and configuration requirements shall also be characterized.

4.2.5.1.2.5 Reference Vehicle Configuration and Mechanical Interfaces. The Offeror shall provide a conceptual description of all major mechanical interfaces with other SLS system elements including the Core Stage and the ground systems Mobile Launcher, as identified in Appendix A, Section 4. The Offeror shall also provide a description, and any figure(s), for its basic vehicle configuration and dimensions.

4.2.5.1.2.6 Reliability. The Offeror shall describe its methodology that improves reliability for its proposed Advanced Booster concept. This methodology shall primarily focus on reliability enhancements towards risk reduction, for example: design and/or operational simplification, failure mode reduction, plans for non-destructive inspection, verification/acceptance tests, and redundancy characteristics.

4.2.5.1.2.7 Concept Risks and Proposed EDRR Summary. This section shall summarize, in order of importance, all relevant risks associated with the Offeror's Advanced Booster concept. The risk list for the Offeror's Advanced Booster concept may include but is not limited to risks associated with: affordability, reliability, technology maturity, materials capability, manufacturing process, non destructive inspection, operations, scaling issues, and performance at all levels of assembly and integration (e.g. part, component, subassembly, assembly, integrated vehicle). The subset of risk areas targeted by the Offeror's proposed EDRR activities shall be described in detail.

The Offeror shall choose risks from the extended list to propose the associated EDRR efforts. The Offeror shall provide a detailed description of the effort and also supply a detailed SOW for each EDRR. For each of the top risks with an associated EDRR, the Offeror shall describe the expected significance and value to the Advanced Booster concept, particularly with respect to NASA's objectives of affordability, reliability, and performance for each proposed EDRR effort. The details of the EDRR efforts shall be proposed within Volume 2 - Intrinsic Merit.

4.2.5.1.3 Affordability Plan. The Offeror shall submit an Affordability Plan per the contents of DRD MA-004, which includes strategies as they relate to the Offeror's Advanced Booster concept and how considerations of cost will be a principal factor from beginning of development through production, operations, and retirement. The affordability plan is envisioned to promote executing the SLS Program within the baseline constraints and explain how the implementation of process and culture changes will deliver sustained annual cost reductions. The plan shall include a detailed description of the identified EDRR areas as it relates to the Offeror's Advanced Booster concept and affordability strategy. The Offeror shall provide pertinent GR&As. Advanced Booster concepts that require modification of SLS Program requirements will be considered if significant affordability gains are shown. The Offeror shall submit a detailed description of the proposed SLS Program

requirement modification and its affordability improvement to the Offeror's Advanced Booster concept as well as to the overall SLS Program affordability within the Affordability Plan.

4.2.5.1.3.1 DDT&E Rough Order of Magnitude (ROM) Cost and Schedule. The Offeror shall submit a cost and schedule ROM for its Advanced Booster concept for DDT&E, production, operations, and retirement using a cost model tool and in-house cost estimates. Costs shall account for affordability strategy, systems integration, Contractor fee, program support, contingency/margin, and vehicle integration costs. The Offeror shall provide pertinent GR&As.

4.2.5.2 Volume 2 – Intrinsic Merit

4.2.5.2.1 Management Approach. The Offeror shall submit a description of its management approach involving interactions among the various individuals or other organizations, its plans for distribution of responsibilities, and arrangements for ensuring a coordinated effort.

4.2.5.2.1.1 Qualifications of Team. The Offeror is responsible for assembling a qualified team to execute this effort, supervise the work, and participate in the conduct of the effort regardless of whether or not the team member is compensated under the award. The Offeror shall submit a description of its team and rationale for each team member's qualification.

4.2.5.2.1.2 Teaming Arrangements. An Offeror who proposes to use NASA facilities or services shall submit a description of its teaming arrangement for the execution of the proposed effort. The Offeror shall submit signed SAAs or letters of intent for SAAs with its proposal. The Offeror shall submit information on all teammates, partners, or other subcontracted effort performing in excess of \$5,000,000 of the total proposed effort per Appendix D, Subcontractor Information. The Offeror shall meet the small business goals as contained in Special Clause H.15, Evaluation of Small Business Subcontracting Goals, of the Model Contract.

4.2.5.2.1.2.1 Space Act Agreements or Cooperative Agreements. To the extent the Offeror requests access to unique NASA resources and technologies such as spaceflight expertise, lessons learned, facilities, spacecraft equipment or other Government property to support its proposed efforts, such NASA resources and technologies shall be identified in the Model Contract Subcontracting Plan. Proposals should identify potential impacts and workarounds if the proposed resources are not available within the price and schedule assumed by the Offeror in its proposal.

An Offeror planning to include NASA services, facilities or equipment to support its effort may enter into separate fully reimbursable SAAs or equivalent agreements with the NASA Center(s) providing such services, facilities or equipment. The agreements shall include the tasks to be performed, facilities to be used with dates, Contractor specifications and requirements for facility modifications and/or refurbishment, and a full-cost assessment of all the work to be performed. For proposal purposes, each Offeror shall provide its own cost estimate for the

requested resources if such reimbursable services have yet to be negotiated with the specific NASA Center(s). Where such agreements have been negotiated, then agreed-upon cost information shall be provided.

The Offeror will be responsible for successful accomplishment of the contract. Price and schedule risk associated with development activities that are dependent upon NASA Center support resides with the Offeror.

The Offeror may communicate directly with the NASA Partnership Office points of contact as provided in Section 8.2 of this NRA, or others as applicable, for facilitation of Government resources and agreements. Communications with points of contact and its designated representatives for the purpose of developing such separate SAAs may continue during the blackout period.

The MSFC managing organization responsible for this NRA will not be responsible for facilitating NASA partnerships with the Offeror. The MSFC managing organization is neither encouraging nor involved with partnerships with NASA Centers. The Offeror is referred to Section 8.2, NASA Partnership Offices.

4.2.5.2.1.3 Facilities, Equipment, and Key Capabilities. The Offeror shall describe available facilities, major items of equipment and key capabilities especially adapted or suited to the proposed effort, and any additional major equipment that will be required. The Offeror shall identify any Government-owned facilities, industrial plant equipment, or special tooling that is proposed for use. The Offeror shall provide evidence of approval from the appropriate Government Project Office for any rent free non-interference use of Government property. NASA facility modifications and/or refurbishment required by the Offeror as specified in an SAA or alternate agreement shall be summarized and include a ROM estimate. The Offeror shall include evidence of the facility availability and the cognizant Government points of contact. The Offeror should consider the funding limitations associated with this NRA in proposing any modification/refurbishment and the time associated with modification/refurbishment in relationship to the proposed effort. Where such arrangements cannot be made, the proposal shall so state.

4.2.5.2.1.4 Schedule. The Offeror shall submit a detailed schedule of all work items to be undertaken. This schedule shall outline the dependencies of work items and critical path. All long lead items and facility schedule conflicts shall be identified. Proposal submission shall be prepared in accordance with DRD MA-003 Section 15.3.

4.2.5.2.1.5 Ground Rules and Assumptions. The Offeror shall list any GR&As pertinent to the Government's understanding of the proposed management approach.

4.2.5.2.1.6 Deviations/Exceptions. The Offeror shall identify and provide rationale for any deviations or exceptions to the NRA and Model Contract. If the Offeror chooses to propose an alternate contract type as referenced in Section 2.1, the

Offeror shall also detail any advantages afforded to the Government to include the risk effect of the alternate proposed contract type.

4.2.5.2.2 Technical Approach. The Offeror shall describe the methodology to be employed to execute the technical objectives, systems engineering approach, innovations, and propose a SOW and a Work Breakdown Structure (WBS) for each EDRR effort proposed under this NRA. The Offeror shall include, as an element of the SOW, a task to describe how the results obtained from the performed EDRR provide significance and value to the Advanced Booster concept, particularly with respect to NASA's objectives of affordability, reliability, and performance. For proposal submission purposes, the SOW, associated Data Procurement Document (DPD), and WBS shall be submitted in Volume 4 – Model Contract; however, these sections will be evaluated under Volume 2 – Intrinsic Merit.

4.2.5.2.2.1 Description of Proposed EDRR Effort. The Offeror shall submit a detailed description of each proposed EDRR effort to mature the stated technology need or reduce the identified risk. Methods and procedures to perform the effort shall be identified.

4.2.5.2.2.2 Relationship to Previous or Ongoing Work. The Offeror shall submit the relationship of the proposed EDRR effort to the present state of knowledge funded by the Government and relationship to previous or ongoing work performed for or funded by a Federal agency for the Offeror and team members. The Offeror shall briefly describe previous accomplishments for related efforts for the Offeror and team members. The Offeror shall state any dependency on previous or ongoing efforts in relationship to its proposed EDRR efforts.

4.2.5.3 Volume 3 – Price

4.2.5.3.1 Introduction. The Offeror shall submit Volume 3 – Price as described herein. The Offeror shall provide the information requested in Appendix E-1 and E-2. Proper presentation, organization, and clarity, as well as adequate supporting documentation, shall be provided to facilitate Government evaluation of the proposal. All price and manpower summary information shall be complete (including but not limited to all in-house, major subcontracted efforts, and other costs, as appropriate) and be consistent with, and traceable to, lower levels of price and labor hour detail contained within the proposal. Narratives shall be provided for each type of summary, indicating which detailed price or labor hour data supports the given summary. The specific location(s) of the supporting data (i.e. volume and section numbers) within the price proposal shall be identified. The Price Volume preparation instructions set forth herein are applicable to the Offeror as a Prime Contractor and any proposed major subcontracts. For price volume purposes only, interdivisional and/or intra-company effort in excess of \$5,000,000 shall be considered “major subcontractor” effort. For purposes of this NRA, major subcontracts are defined as any teammate, partner, or other subcontracted effort performing in excess of \$5,000,000 of the total proposed effort.

4.2.5.3.2 General Instructions. The Offeror's Price Volume shall be organized as described below.

4.2.5.3.2.1 Each Price proposal shall include page numbering and a table of contents. The Offeror shall provide the following information on the first page of the pricing proposal:

- Solicitation number
- Name and address of Offeror
- Name and telephone number of point of contact for clarification or questions regarding this proposal
- Type of contract (FFP)
- Proposed total price
- Any Government property required for use in performance of the contract
- Whether the Offeror (a) is subject to the Cost Accounting Standards (CAS); (b) has submitted a Cost Accounting Statement Board (CASB) Disclosure Statement, and if it has been determined adequate; (c) has been notified of possible/actual noncompliance with its Disclosure Statement or CAS, and, if yes, an explanation; (d) whether any aspect of this proposal is inconsistent with disclosed practices or applicable CAS, and, if so, an explanation; and (e) whether the proposal is consistent with established estimation and accounting principles and procedures and FAR Part 31, Cost Principles, and, if not, an explanation.
- Date of submission

4.2.5.3.2.2 The Offeror shall propose the appropriate allocation of funds based on its EDRR effort. The Offeror's proposed price will be evaluated for reasonableness, completeness, and the extent to which the Offeror complied with the expected funding allocations in this NRA. No advantage will accrue to an Offeror who proposes to perform work for an unreasonably low price. The Offeror is cautioned that unreasonably low estimates may be grounds for eliminating a proposal from competition on the basis that the Offeror does not understand the requirement. To avoid confusion in this regard, the Offeror shall provide substantiation of any proposed corporate resources or reliance on past or ongoing efforts. The burden of demonstrating price credibility lies with the Offeror. Information in the Price Volume that pertains to other volumes will not be evaluated.

4.2.5.3.2.3 Explanatory notes shall accompany the price proposal to provide identification and estimated price of major capital equipment (over \$100,000) items to be acquired and clarification of other items in the price proposal that are not self-evident.

4.2.5.3.2.4 The Offeror is responsible for submitting a comprehensive price proposal including all required subcontractor proposals. The Offeror's and major subcontractors' price proposals shall adhere to the provisions of this volume. Prospective subcontractors have the option of submitting proprietary price information in a sealed envelope through the Prime Offeror or in the form of a complete price volume directly to the Government no later than the date and time specified in this NRA. Subcontract proposals shall be included for each major subcontract and indicate the type of contract, tier level, and assumptions in the subcontract agreement.

4.2.5.3.2.5 NASA funding may not be used for foreign research efforts at any level, whether as a collaborator or as a subcontractor. The direct purchase of supplies and/or services, which do not constitute research, from non-U.S. sources by U.S. award recipients is permitted. Additionally, in accordance with the National Space Transportation Policy, use of a non-U.S. manufactured launch vehicle is permitted only on a no-exchange-of-funds basis.

4.2.5.3.2.6 Electronic copies of the Offeror's price proposal shall be prepared and submitted in Microsoft Office 2007 applications (Word, Excel, and Power Point). The Offeror shall not remove the functionality of the Excel spreadsheets that are submitted in the electronic copy of the Price Volume. All electronic files must be searchable and shall not contain scanned documents. All electronic files associated with the Price Volume shall not contain hidden formulas, tables, and shall not be locked or protected. Any "hard values" shall be explained and supported. The formats for pictures, drawings, figures, etc., shall be Bit-Mapped Picture (.bmp) or JPEG Picture (.jpg).

4.2.5.3.2.7 The Offeror and its major subcontractors shall submit Price proposals in two formats, conventional hard copy bound format and electronic format. In the event of a discrepancy between the hard copy and the electronic format, the hard copy will be considered the intended text. The hard copy shall be in the Offeror's conventional format. The electronic submission shall be compatible with the software specified above.

4.2.5.3.3 Specific Price Detail. This section shall contain a summary of labor hours and other information supporting the proposed price. The following types of information are specifically required in this summary:

- Proposed price and profit expenditures in accordance with Appendices E-1 and E-2 (Element of Price Detail) in total and for each risk area in thousands of dollars, by Government fiscal year (October through September) over the contract period of performance. Therefore, the Offeror shall provide pricing data in accordance with Appendix E-1 for the total proposed effort and a separate Appendix E-1 for each stand alone EDRR proposed. Major subcontracted pricing data shall be provided in accordance with Appendix E-2 for the total proposed effort and a separate Appendix E-2 for each stand alone EDRR proposed. Additional cost elements may be included if necessary to reflect the Offeror's cost accounting structure. Assume the following dates for purposes of price phasing:
 - Authority to Proceed (ATP) October 1, 2012
 - End of Period March 31, 2015
- A listing of all key GR&As having significant impact on the proposed price. This listing includes resources requested from the Government (e.g., Government-furnished equipment and property, including estimated costs if required for Offeror's technical approach) and key technical and management requirements driving price.

- A clear explanation of cost estimating relationships for management, systems engineering, and all other such administrative costs when performing single EDRRs versus multiple EDRRs (where cost savings would occur if multiple EDRRs are selected for negotiation). Offeror's format is acceptable.
- The price of each EDRR as "free standing" to allow for award of a single EDRR at the proposed price. Therefore, for each EDRR, the Offeror shall submit a complete set of cost and price data in accordance with Appendices E-1 and E-2.
- A summary table converting productive labor hours to equivalent people (EP) for the prime and major subcontractors. The Government's definition of an EP is: One EP equals 2,000 available work hours per year. Offeror shall include an explanation of productive versus non-productive labor hours.

4.2.5.3.4 Deviations from Price Volume Requirements. Any deviations from the requirements in this Price Volume shall be fully explained and supported. Any accounting changes, management challenges, cost sharing, corporate resource arrangements, or other competitive features without detailed explanation and proposed language to be incorporated into any resultant contract will not be considered. This requirement also applies to any major subcontractor.

4.2.5.3.5 Additional Price Requirements if Selected for Award.
The following types of information are specifically required in this summary:

- A summary table listing all labor categories used in the proposal and its associated direct labor rates, along with escalation factors used for each year of the acquisition.
- A summary table listing all indirect rates used in the proposal for each year of the acquisition and the calendar month in which the rates change annually. Provide a conversion of Contractor fiscal year rates to Government fiscal year rates and a basis of indirect rates used.
- A detailed WBS at a sufficient level to reflect a complete understanding of the work selected.
- Detailed Basis of Estimates (BOEs) to support price and labor hour data for work awarded. BOEs shall include the methodologies used by the Offeror and major subcontractors in estimating the labor skill mix by labor hours, other direct cost, materials, etc.

4.2.5.4 Volume 4 – Model Contract. A FFP Model Contract is provided as Attachment 1 to this NRA. The Offeror shall address the highlighted sections as contained within the Model Contract, along with any proposed deviations and exceptions, using the track changes feature or replace with an alternate contract or agreement as applicable in its entirety. The Offeror shall also provide a Statement(s) of Work, DPD (if modifications are proposed), WBS, and Subcontracting Plan with each proposal. An Offeror selected for award shall then provide an Organizational Conflict of Interest Avoidance Plan and an IT Security Management Plan. The Safety, Health, and Environmental (SHE) Plan, DRD SA-001, will be tailored during negotiations. Initial submission of the SHE Plan is required no later than 30 calendar days after award.

4.2.5.4.1 Statement of Work. The Offeror shall submit a detailed SOW for each proposed EDRR effort to be undertaken and shall outline the plan of work, including all efforts to be performed and a description of methods and procedures to be utilized. If multiple SOWs are selected, they will become integrated into a single SOW, and attached to the Model Contract.

4.2.5.4.2 Data Procurement Document (DPD). Any effort awarded as a result of this NRA shall include a DPD. A model DPD has been provided as part of this NRA. The Offeror shall provide rationale for any addition or deletion to the model DPD and show all exceptions in a redline version as part of the proposal submittal. An Offeror selected for award shall be required to update its final DPD with the appropriate contract number prior to award.

4.2.5.4.3 Work Breakdown Structure. The Offeror shall submit a WBS per EDRR at a sufficient level to facilitate a complete evaluation and understanding of the Offeror's proposal.

4.2.5.4.4 Subcontracting Plan. An Offeror submitting a proposal that totals \$650,000.00 or greater shall provide a small business subcontracting plan as a component of its subcontracting plan (Attachment J-5) with its proposal submission, in accordance with FAR 19.704 Subcontracting Plan Requirements and Special Clause H.15, Evaluation of Small Business Subcontracting Goals. The Offeror shall include copies of Space Act Agreements (or Letters of Intent), Cooperative Agreements, and Enhanced Use Lease Agreements that are applicable to the Offeror's proposed effort in Attachment J-5.

4.2.5.5 Security. Proposals shall not contain security classified material.

4.2.5.6 Special Matters

4.2.5.6.1 The Offeror shall include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest provisions, or information on such other topics as may be required by the nature of the proposed effort and to comply with applicable statutes, executive orders, or other Government-wide guidelines.

4.2.5.6.2 The Offeror shall identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

4.2.5.7 Proposal Format and Length

4.2.5.7.1 Proposals should be as brief as possible, concentrating on substantive material. Each copy of the proposal shall be provided as a complete set. Since proposals are not returned, the Offeror shall avoid use of "one-of-a-kind" attachments.

4.2.5.7.2 The Offeror shall clearly mark and identify each of the pages subject to the page limitations. Proposals submitted in response to this announcement

shall be written in English and contain at least the following information in the format shown below:

<u>REQUIRED CONSTITUENT PARTS OF A PROPOSAL</u> (in order of assembly)	<u>PAGE LIMIT</u>
Restriction on Use and Disclosure of Proposal Information (each volume)	1
Table of Contents (each volume)	Unlimited
Volume 1 – Relevance to NASA Objectives	
Executive Summary	3
Advanced Booster Concept Description	35
Affordability Plan	15
Volume 2 – Intrinsic Merit	50
Schedule	Unlimited
Volume 3 – Price	Unlimited
Volume 4 – Model Contract	Unlimited except as stated below
Statement of Work	10 (per ED RR)
Data Procurement Document (If Offeror makes modifications)	40
Work Breakdown Structure	3 (per ED RR)

A page is defined as one side of a sheet, 8.5” x 11,” with a minimum of one (1) inch margins on all sides using not less than twelve (12)-point type Times New Roman font for standard text with normal kerning/leading (spaces between characters/lines). Text shall be in single column format. There shall be a maximum of 52 lines per page using uncompressed font. The proposal text shall be printed on non-gloss white paper. Double-sided printing for proposal copies is preferred but not required. Non-standard text, including graphics, charts, tables, and callouts, shall use no smaller than 8-point type Times New Roman font. Foldouts are allowed. Each foldout shall be single sided, no larger than 11” x 17,” and shall count as two pages. The front of the foldout will have 2 page numbers and the backs shall be blank and not be numbered. Use of non-standard text should be used only where appropriate. Non-standard text shall not be used to avoid the page limitations as specified in this NRA (e.g., providing all information in table format using 8-point font).

Each volume shall contain a page numbering convention and shall be consecutively numbered. A partially filled page shall count as one (1) page.

Items addressed under Special Matters, Section 4.2.5.6 are not excluded from the page count. Any pages submitted that exceed the page limitations as specified above will be excluded from the evaluation. The Offeror will be notified of any page overages and the pages will be returned to the Offeror.

Any type of proposal binding is acceptable. Binding covers are not considered part of the content page limit; however, any information included on the binder cover will not be evaluated.

The Offeror is required to submit a completed and signed Representations and Certifications document which is available at <https://orca.bpn.gov/>. The Representations and Certifications as completed by the successful Offeror will be incorporated in its entirety by reference, into any resulting contract, with the same force and effect as if they were given in full text. If there are any significant changes to the Representations and Certifications, the successful Offeror shall notify the Contracting Officer in writing as soon as the changes are known.

4.2.5.8 Joint Proposals. Where multiple organizations are involved, the proposal shall be submitted by only one of them. It shall clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. The award will be made to only the lead organization that submitted the proposal. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case each proposal will be evaluated separately and separate awards will be made to each selected organization.

4.3 Proposal Submission Dates, Time, and Location

4.3.1 Proposal submissions. Proposals shall be submitted no later than April 9, 2012, 1:00 p.m. CDT. One original proposal package, plus ten paper copies and two digital copies shall be submitted to Kathryn Cooper at NASA, George C. Marshall Space Flight Center, Attn: Kathryn Cooper/PS41, Building 4202, Room 211A, MSFC, AL 35812. Electronic copies shall be provided on virus free, read-only CDs in PC format and shall be readable by Microsoft Office Word 2007 edition and Microsoft Office Excel 2007 edition. Hardcopies and CDs are to be labeled externally with the NRA Number, Company Name, and Date Prepared and annotated "Source Selection Information - see FAR 3.104" shall be provided. Proposals, evaluation of proposals, and communication of the results of its evaluation shall not be performed through NSPIRES or through Grants.gov.

4.3.2 Late Proposals. Proposals or proposal modifications received after the latest date specified for receipt may be considered if a significant reduction in cost to the Government is probable or if there are significant technical advantages, as compared with proposals previously received.

4.3.3 Withdrawal. Proposals may be withdrawn by the Offeror at any time before award. The Offeror shall notify NASA if the proposal is funded by another organization or of other changed circumstances which require withdrawal of the proposal.

4.3.4 Cancellation of NRA. NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for canceling the NRA or for an interested party's failure to receive actual notice of cancellation.

5.0 APPLICATION REVIEW INFORMATION

Failure to follow instructions for proposal submission may result in a determination that the proposal is unacceptable and rejected.

5.1 Evaluation Criteria and Basis for Award

5.1.1 Evaluation Factors. Evaluation factors for this effort are provided below:

- 1) Relevance to NASA Objectives
- 2) Intrinsic Merit
- 3) Price

All three evaluation factors are essentially equal in importance.

5.1.2 Basis for Award

5.1.2.1 The selection of the proposals for contract award will be based upon the evaluation of the Offeror's Advanced Booster concept and proposed EDRR effort and funding availability.

5.1.2.2 Evaluation of the proposals received in response to this NRA will be accomplished by Government personnel only.

5.1.2.3 All Government personnel participating in the evaluation will be bound to protect proprietary and source selection information.

5.1.3 Evaluation Factors and Criteria

5.1.3.1 Factor 1: Relevance to NASA Objectives. NASA will assess the extent to which the submitted Advanced Booster concept(s) and the proposed EDRR effort(s) enhances affordability, improves reliability, and meets the set of performance requirements.

Specifically, the Government will evaluate the:

- Executive Summary
- Advanced Booster concept including Appendix B
- Relevant risks associated with the concept
- Details of the targeted subset of risks proposed for mitigation
- EDRR summaries including their value and significance
- Affordability Plan
- Reliability enhancements based on the proposed methodology
- Modifications to SLS Program requirements that impact affordability
- DDT&E ROM Cost and Schedule

Criteria

Relevance to NASA Objectives will be given strengths and/or weaknesses for each proposal. These strengths and weaknesses will be consolidated and identified in descending order of importance with significance assigned as appropriate. Strength and weakness criteria are listed in Table 1.

Table 1	
Significant Strength	An aspect of the proposal that greatly enhances the merit of the proposal or the potential for successful contract performance.
Strength	An aspect of the proposal that will have some positive impact on the merit of the proposal or the potential for successful performance of the contract.
Weakness	A flaw in the proposal that decreases the merit of the proposal or increases the risk of unsuccessful contract performance.
Significant Weakness	A flaw that appreciably decreases the merit of the proposal or increases the risk of unsuccessful contract performance.

Subsequently, a consensus adjectival rating for Relevance to NASA Objectives will be assigned for each proposal. These adjectival ratings are based on the definitions in Table 2.

Table 2	
Excellent	Exceptional merit that fully responds to the objectives of the NRA as documented by numerous or significant strengths and has no significant weaknesses.
Very Good	High merit that fully responds to the objectives of the NRA and strengths outweigh any weaknesses.
Good	Credible response to the NRA and strengths and weaknesses essentially balance each other out.
Fair	Nominal response to the NRA but weaknesses outweigh any strengths.
Poor	Flawed response having weaknesses that significantly outweigh strengths.

5.1.3.2 Factor 2: Intrinsic Merit. As a part of the evaluation process, each proposal will be assessed for intrinsic merit as related to the NASA objectives of affordability, reliability, and performance. Intrinsic Merit includes management approach, technical approach, and small business utilization. Model Contract Clauses B.3 Consideration and Payment, F.3 Contract Hardware Deliverables, and H.16 Advanced Agreement in Rights in Data will also be evaluated under Intrinsic Merit. Additionally, Attachment J-1 Statement of Work, J-2 Data Procurement Document, J-4 Work Breakdown Structure, and J-5

Subcontracting Plan will be evaluated under Intrinsic Merit. The Government will evaluate the appropriateness of the asserted data rights proposed as unlimited, limited, and/or restricted. The Government will evaluate any proposed alternate contract type or agreement for advantages afforded to the Government to include any change in risk effect. While inclusion of corporate resources is not part of the evaluation criteria, it may impact NASA's evaluation of the intrinsic merit of the proposal. For example, an Offeror's investment in facilities, tooling, or IR&D that exceeds the Offeror's proposed EDRR priced activities will be considered as part of intrinsic merit and in understanding the reasonableness of price.

Management Approach

The Government will evaluate how the Offeror proposes to manage the EDRR effort. The Government will evaluate the Offeror's evidence of existing capabilities for leading the design and development of space-qualified systems applicable to a variety of heavy lift launch vehicles.

The Government will evaluate the Offeror's integral factors for achieving the proposal objectives including the following considerations:

- a. Effectiveness and suitability of the Management Approach.
- b. Effectiveness and suitability of teaming, subcontracting, and unique partnering arrangements.
- c. Effectiveness and suitability of facilities, equipment, and key capabilities.
- d. Performance data contained in the Government's Past Performance Information Retrieval System (PPIRS) database for both the Offeror and any major subcontractor (commercial organizations only). A major subcontractor is defined as a teammate, partner, or other subcontracted effort performing in excess of \$5,000,000 of the total proposed effort. The Offeror will not be requested to provide its past performance information; and if submitted in the Offeror's proposal, it will not be evaluated. Review of PPIRS information for the prime, teammates, partners, and major subcontractors will be based on relevant scope of effort and dollar value on contracts performed within the previous three years in relation to the Offeror's proposed Advanced Booster concept and associated EDRRs. The Government will notify the Offeror of any past performance information reviewed in PPIRS determined as a weakness after identification. After notification, the Offeror may provide to the Government supplemental information on the performance and the Offeror's corrective actions and the Government will consider this information in relationship to the weakness identified through PPIRS. Lack of relevant past performance will not be evaluated favorably or unfavorably.
- e. GR&As.
- f. Deviations and exceptions to the NRA and/or model contract. The Government reserves the right to disqualify a proposal based on significant deviations or exceptions to the NRA or model contract.
- g. Overall EDRR schedule and proposed milestones including proposed period of performance.

Technical Approach. The Government will evaluate the extent to which the Offeror has demonstrated a logical methodology, including a thorough knowledge of the technical objectives, a sound systems engineering approach, innovativeness, and technical management issues as related to the proposed technical approach. The Government will evaluate the detailed description of proposed EDRR effort and how the predicted results obtained from the proposed EDRR will provide significance and value to the Advanced Booster concept. The Government will evaluate the relationship to previous or ongoing work.

Small Business Utilization. The Government will evaluate the Offeror's proposed approach to meet or exceed established small business subcontracting goals in the Model Contract. The small business subcontracting goals will be evaluated on the total proposal value versus each individual EDRR effort value.

Criteria

Intrinsic Merit will be given strengths and/or weaknesses for each EDRR in accordance with the definitions listed in Table 1 above. These strengths and weaknesses will be consolidated and identified in descending order of importance with significance assigned as appropriate. Subsequently, a consensus adjectival rating for each EDRR effort will be assigned. These adjectival ratings are based on the definitions in Table 2 above.

5.1.3.3 Factor 3: Price. The Government will evaluate the total price for each EDRR proposed. The price reasonableness, or the lack thereof, will be used as an indicator of the Offeror's understanding of the requirement. Each Offeror's proposed cost phasing will be evaluated under the Price Factor. Overall lack of price reasonableness will adversely impact the Offeror's Price confidence. The Government will evaluate price components in accordance with the price data submitted for Section 4 of the NRA. The overall price reasonableness, completeness, and the extent to which the Offeror complied with the anticipated funding allocation and phasing in the NRA will be evaluated. The Government will evaluate all categories in accordance with Appendices E-1 and E-2. While inclusion of corporate resources is not part of the evaluation criteria, it may impact NASA's evaluation of the price reasonableness of the proposal.

Based on the price evaluation, the Government will identify any price or elements of price that appear to be reasonable and complete for the efforts priced. After identification of omissions, inconsistencies, or conditions/qualifications associated with the proposed prices or elements, the Government will determine if these aspects of the proposal represent a decreased level of confidence to providing the effort in accordance with the terms of the contract.

Criteria

Price will be given findings for each EDRR in accordance with the definitions listed in Table 1 above. The findings will be consolidated and identified in descending order of importance as appropriate. Subsequently, a consensus level of confidence (High, Medium, Low, as shown below in Table 3) in the Offeror's ability to successfully perform the contract at the proposed price will be assigned for each EDRR effort.

Table 3.

High	The Government has a very high level of confidence that the Offeror can perform successfully at or below the proposed price.
Medium	The Government has a reasonable level of confidence that the Offeror can perform successfully at or below the proposed price.
Low	The Government has a marginal level of confidence that the Offeror can perform successfully at or below the proposed price.

5.2 Selection Process. Once the evaluations are finalized, the Chairperson will present the findings of the evaluation board to the Selection Official for decision. The Selection Official is the Deputy Associate Administrator for Exploration Systems.

When a proposal is not selected for award, the Offeror will be notified in writing. An Offeror desiring additional information may contact the Contracting Officer who will arrange a debriefing. Debriefings will be conducted in accordance with FAR/NFS Subpart 15.5, entitled *Pre-award, Award, and Post Award Notifications, Protests, and Mistakes*.

When a proposal is selected for award, negotiation and award will be handled by the MSFC Procurement Office. The proposal is used as the basis for negotiation. The Contracting Officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation. The Offeror shall provide a copy of its Organizational Conflict of Interest Avoidance Plan and IT Security Management Plan, updated Subcontracting Plan, including a copy of all major subcontracts either executed or planned for the EDRR(s) selected, and identify additional pricing information with its updated Model Contract as directed by the Contracting Officer. Initial submission of the SHE Plan is required no later than 30 calendar days after award.

NASA reserves the right to select any standalone ABEDRR or combination of ABEDRRs to maximize the programmatic benefits for NASA.

5.3 Partial Awards and Participation with Others. NASA may select only a portion of a proposed effort, usually at a level of support reduced from that requested in the original proposal, or may offer tentative selections in which NASA requests the Offeror to team in a joint effort. In such a case, the Offeror will be given the opportunity to accept or decline such selection. If the Offeror accepts, a revised budget and SOW may be required before funding action on the proposal can be initiated. If the Offeror declines a partial selection or participation in a joint effort, the selection may be withdrawn in its entirety by NASA. Additionally, NASA may decide to award an effort for less than the full period of the proposal.

5.4 Anticipated Announcement and Award Dates. NASA's goal is to announce selections as soon as possible. However, NASA does not usually announce new selections until the funds needed for those awards are approved through the Federal budget process. Therefore, a delay in the budget process for NASA usually results in a delay of the selection date. Twelve

months after the proposal due date, the Offeror may contact, in writing, the responsible Contracting Officer listed in Section 7.0, NASA Contact, for the status of the selection activity.

5.5 Process for Appeals

5.5.1 Ombudsman Program. The NASA Procurement Ombudsman Program is available under this NRA as a procedure for addressing concerns and disagreements. The clause at NASA FAR Supplement (NFS) 1852.215-84 (“Ombudsman”) is incorporated into this NRA. The cognizant MSFC Installation ombudsman is posted at http://prod.nais.nasa.gov/pub/pub_library/Omb.html.

5.5.2 Protests. An Offeror may submit a protest under 48 CFR Part 33 (FAR Part 33) directly to the Contracting Officer. As an alternative to the Contracting Officer’s consideration of a protest, an Offeror may submit the protest to the Assistant Administrator for Procurement, who will serve as or designate the official responsible for conducting an independent review. Protests requesting an independent review shall be addressed to Assistant Administrator for Procurement, NASA Office of Procurement, Washington, D.C. 20546-0001. Protests, as defined in Section 31.101 of the FAR, that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served to the Contracting Officer by obtaining written and dated acknowledgement of receipt from: Kathryn Cooper, Contracting Officer, PS41, George C. Marshall Space Flight Center, MSFC, AL 35812. The copy of any protest to the GAO shall be received in the office designated above within one day of filing a protest with the GAO.

6.0 AWARD ADMINISTRATION INFORMATION

6.1 Award Notices

6.1.1 Notification of both the selected, as well as the non-selected Offerors, will be consistent with the policy given in Section C.5.3 of the *NASA Guidebook for Proposers*. For selected Offerors, the Offeror’s business office will be contacted by a NASA Contracting Officer, who is the only official authorized to obligate the Government.

6.1.2 Based on the size and scope of the awards it is anticipated that FFP contracts will be the appropriate instrument (unless the Offeror’s proposed alternative contract instrument is selected for award [refer to Section 2.1]). Contract awards will be subject to the provisions of the Federal Acquisition Regulations (FAR) <https://www.acquisition.gov/far/> and the NASA FAR Supplement (NFS) <http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>.

6.2 Administrative and National Policy Requirements. This solicitation does not invoke any special administrative or national policy requirements, nor do the awards that will be made involve any special terms and conditions that differ from NASA’s general terms and conditions as given in the *NASA Guidebook for Proposers*. Please note that the Offeror shall comply with Homeland Security Presidential Directive / HSPD-12. HSPD-12 applicability will be determined during negotiation for award for selected proposals.

6.3 Reporting Requirements. Required reports for contract awards will be negotiated with the Offeror, subject to the terms and conditions of the FAR and NASA FAR Supplement, located at <https://www.acquisition.gov/far/> and <http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>, respectively.

7.0 NASA CONTACT. All questions shall be submitted in writing to the point of contact shown below within 30 calendar days of the issue date of this NRA. Questions received after the specified dates will not be addressed. Questions and responses will be posted on the web at <http://www.fedbizopps.gov>, <http://prod.nais.nasa.gov>, or <http://nspires.nasaprs.com/> site.

Point of Contact:

NASA Marshall Space Flight Center
Attn: Kathryn Cooper, PS41
Marshall Space Flight Center, AL 35812
Mary.K.Cooper@nasa.gov

Note: Proposals shall not be submitted to this email address. Proposals shall be submitted as described in Section 4.3, Proposal Submission Dates, Time, and Location.

No communication concerning this NRA may be made to any NASA official other than those specifically listed in this NRA.

8.0 OTHER INFORMATION.

8.1 Announcement of Updates/Amendments to Solicitation. It is possible that additional programmatic information may develop before the proposal due date. If so, such information will be added as a formal amendment to this NRA. Such additional information may be, but is not limited to, clarifications or questions and answers. It is the responsibility of the prospective Offeror to check for updates concerning the SLS ABEDRR acquisition.

8.2 NASA Partnership Offices. Each NASA Center has a partnership office that can help coordinate and collaborate with industry to support various development activities. The following is contact information for each NASA Center:

- a. Johnson Space Flight Center - JSC Strategic Opportunities and Partnership Development Office, 281-483-3000, JSC-Partnerships@mail.nasa.gov
- b. Dryden Flight Research Center - John Del Frate, 661-276-3704, john.h.delfrate@nasa.gov
- c. John C. Stennis Space Center - Anne Peek, Assistant Director, Project Directorate, Stennis Space Center, 228-688-1148, Anne.H.PEEK@nasa.gov
- d. Goddard Space Flight Center - Nona Cheeks, Chief Innovative Partnership Program Office, 301-286-5810, nona.k.cheeks@nasa.gov
- e. Langley Research Center - Michelle Ferebee, 757-864-5617, michelle.t.ferebee@nasa.gov

- f. Kennedy Space Center – KSC Center Planning & Development Office, Tom Engler, 321-861-3127, tom.engler@nasa.gov
- g. Glenn Research Center - Office of Technology Partnerships and Planning, Joe Shaw, 216-977-7135, robert.j.shaw@nasa.gov
- h. Jet Propulsion Laboratory – Commercial Program Office, Indrani Graczyk, 818-354-2241, Indrani.Graczyk@jpl.nasa.gov
- i. Marshall Space Flight Center - MSFC Partnerships Office, Stacy Counts, 256-544-6004, stacy.m.counts@nasa.gov

8.3 NASA Engine Test Stands. The following point of contact is provided to assist the Offeror in determining suitable NASA locations for engine testing:

Rocket Propulsion Test Program Manager, Roger Simpson, 228-688-1874,
Roger.D.Simpson@nasa.gov

9.0 CONCLUDING STATEMENT. Through this NRA, NASA encourages the participation of industry in its SLS Advanced Booster EDRR acquisition. Additionally, for planning purposes only, the Offeror is notified that NASA still intends the future Advanced Booster DDT&E phase to be a FAR based effort.